

PRODUCTION SLUG INJECTION MACHINE FOR FABRICATION OF
HTGR FUEL RODS

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Abstract

A conceptual design of a production-scale slug injection machine for fabrication of HTGR fuel rods has been developed at Oak Ridge National Laboratory. This production machine employs the slug injection process, which has been demonstrated on a laboratory fuel rod machine. The proposed production machine has a projected fabrication rate of 35,000 to 70,000 fuel rods per day, and it is applicable in both contact processing systems for production of fuel rods from virgin fuel and remotely operated processing systems for production of fuel rods from recycled fuel.

Introduction

A pilot plant process is to be designed and operated at Oak Ridge National Laboratory (ORNL) to demonstrate the feasibility of commercial fabrication of HTGR fuel elements from recycled fuel. The slug injection process has been under development at ORNL for the past few years as a method for fabricating fuel rods from both virgin fuel in contact plants and recycled fuel in remotely operated plants.¹ This process, which is illustrated in Fig. 1, has been demonstrated on manual laboratory fuel rod machines and on the laboratory rod machine² illustrated in Fig. 2. This laboratory rod machine is the basis for the conceptual design of the production-scale fuel rod fabrication machine described herein. The

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